APELLIX® POWER WASH SYSTEM™

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IMPORTANT NOTE

Apellix® systems are designed and manufactured in Florida, USA. Our products, procedures, and processes are covered by one or more U.S. and other patents and pending patent applications, including 10,399,676, 9,611,038, 10,011,352, 10,195,629, 11,167,847, and 11,235,890 and others apply. Please see https://www.Apellix.com/patents

You are responsible for being aware of local, state, and federal regulations. This manual is not intended to provide information or coverage of rules.

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NOTE: The following was modified.
Version 1.1 to 1.2
April 2024

Battery Care (page 17,18)

Takeoff and Use (page 16)

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Precautions for Safe Use to Avoid Possible Damage or Injury.

Do not attempt to operate this system if any of its components are damaged, in inclement weather (precipitation, cold, heat, wind, etc.) or without trained, knowledgeable personnel. Never operate this or any machinery under the influence of drugs or alcohol or with a physical or mental impairment impacting clear thinking, safe use, and proper operations.

Apellix Support Center

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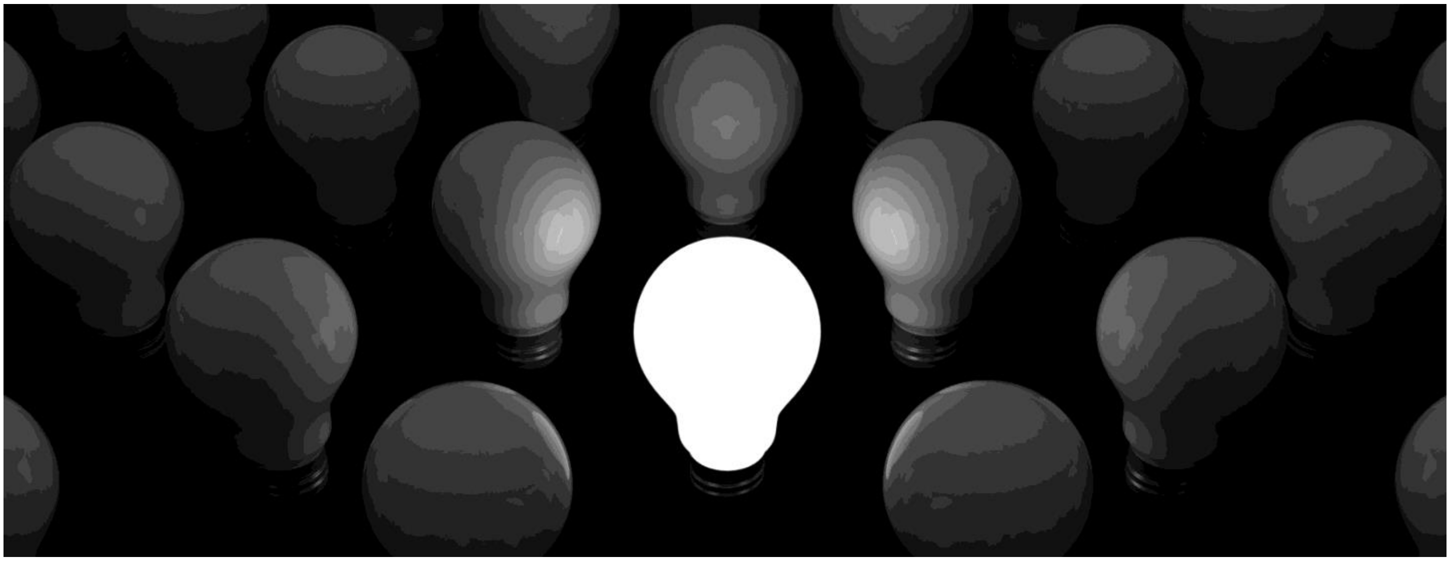


Never feel you are in the dark. Apellix Support can illuminate your path to success

APELLIX® POWER WASH SYSTEM™

QUICK START GUIDE

This Quick Start Guide assumes you are operating in the United States, have the required Federal Aviation Administration (FAA) Remote Pilot Certification and any other necessary authorizations, are an experienced drone pilot (over 100 hours of flight time), and are knowledgeable about drone piloting and safety practices. Further, this guide assumes you are knowledgeable about cleaning practices and related safety issues and that you have received training from Apellix on the Apellix Power Wash System.

Note: The User's Manual contains additional information and setup instructions, including photos. This quick start outline should only be used once you are comfortable and familiar with the User's Manual content.

I. Before you Fly
   a. Review all materials in Operations Manual and Safety Manual.
   b. Develop a flight plan and complete a Job Safety Analysis (JSA).
   c. Conduct a preflight inspection (see the note about preflight checklists at the end of the document).
   d. Ensure your environment is safe and you are legally permitted to fly.

II. System Setup
   a. Remove the Apellix Power Wash drone and accessories from the travel case. Save all packing materials. Inspect for damage.
   b. Fully charge all batteries, including the radio controller, and the battery for the in-line ball valve system.
   c. Set the drone on a flat, stable surface, then extend it arms to flight position (horizontal) by sliding red locking pins toward the aircraft's center, then raising the arm until it clicks and locks in place.
   d. Ensure propellers are securely mounted on motors using a 4mm screwdriver tool (included). If you have foldable propellers, unfold them into a reasonably straight line, upon startup, as the propellers spin they will straighten for flight. Caution, there are eight propellers. If even one is damaged, loose, or installed wrong it will cause the drone to flip over upon attempted takeoff.
   e. Turn on the radio controller.
   f. Install batteries securely onto the drone using Velcro straps and connect power to the drone using yellow battery connection to UAS connection. This connection only fits one way. The system will beep once to indicate power. Always keep hands away from propellers when connecting or disconnecting batteries.
   g. Perform **Magnetometer Calibration** (see the note about magnetometer calibration at the end of this document) and confirm a successful calibration.
   h. The Apellix Power Wash UAS is now set up for flight.

III. Flight Setup
  a. Connect the hose to the drone using the quick connect located on the underside of the drone body above the landing gear (legs).
  b. Make sure the radio controller is fully charged and turned on. Install batteries on the drone and on the remotely operated ground based inline ball valve. Start the pump.
  c. Test the inline pump valve using the toggle switch on the radio controller to start the flow of material to the drone, then stop the flow of material to the drone.
  d. When the flight zone is clear and it is safe, start the motors, and ensure everything has started correctly and GPS lock has occurred. If you are still getting familiar with the radio controller operation, please refer to the operating manual. Take off and fly straight up, stopping a few meters off the ground to ensure the drone is flying normally.
  e. Use the drone to position the tether directly under the work area as part of your flight plan. A good flight and hose management plan is essential for successful jobs.
  f. Perform the desired cleaning while monitoring battery power levels as shown on the radio controller. Do not drain batteries fully. If battery levels reach a critical level, the UAS will attempt an emergency landing straight down. It will not return to the takeoff location. This results in little to no pilot control of the descent.
  g. Once landed, unplug the battery from the drone, and turn off the radio controller. If you are landing to swap batteries, do not turn off the radio controller.
  h. Disconnect the battery from the inline ball valve.

IV. Post-Flight Maintenance
  a. After each use, the system must be cleaned to ensure no residual chemicals or cleaning agents remain on the drone. Not cleaning the system voids the warrantee and is often detrimental to the safe operations of the drone.
  b. After each use, the system must be inspected to ensure the system remains in good working order.
  c. Use best management practices for battery recharges and maintenance. Always follow the instructions of the battery and battery charger manufacturer.
  d. Do not leave the drone in direct sunlight, exposed to extreme heat, or with chemicals not cleaned off it.

Apellix Support

If you have any questions regarding your Apellix Power Wash System, please contact Apellix Support at +1-904-647-4511 (voice or text) or by email at support@apellix.com. We are here to help you and your business succeed.

APELLIX® POWER WASH SYSTEM™ USER MANUAL

Document Scope

This manual provides information for the safe setup, use, and operation of an Apellix Power Wash aerial robotic system (drone and accessories). Each person operating the Apellix system is responsible for being aware of local, state, and federal regulations. This manual does not provide information on such rules. In this document, the term drone, UAV (uncrewed aerial vehicle), and UAS (uncrewed aerial system) may be used interchangeably to refer to the Apellix Power Wash System. Please take the time to read this document and thoroughly understand it so you can operate the Apellix Power Wash system safely.

Safety is the fundamental driver for the work performed at Apellix. By removing workers from dangerous heights, Apellix is engineering a safer occupational environment for the maintenance, inspections, cleaning, and coatings industry. We endeavor to create the safest technology on the market by eliminating personnel needing to physically access elevated industrial surfaces or encounter hazardous or dangerous substances or environments.

The Apellix Power Wash system requires an experienced drone pilot. Flying drones close to structures is complicated due to the physical proximity of structures. You may encounter complications with wind patterns, compromised GPS or magnetometer signals, and other factors.

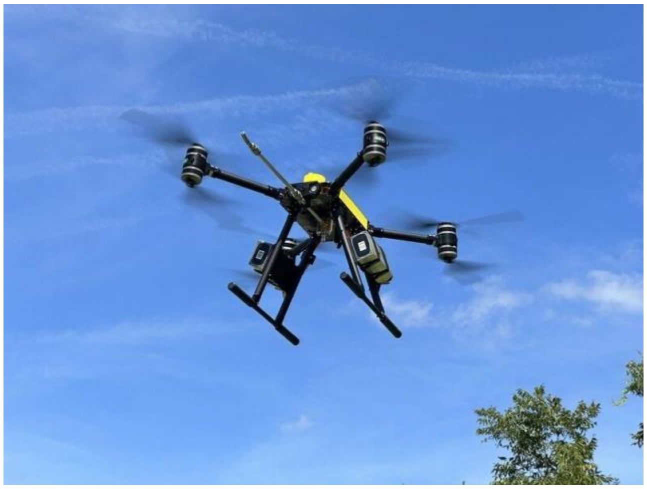
The drone operator must be licensed by the appropriate regulatory agencies and follow all applicable local, regional, state, federal, and national laws, rules, and regulations. For example, to fly the systems in the United States, you must be an FAA (Federal Aviation Administration) Certificated Remote Pilot, issued under Part 107, often referred to as an FAA part 107 drone pilot. Further, depending on the chemicals used, you may be required to operate under FAA Part 137, Environmental Protection Agency (EPA), and other regulations and laws.

PRESSURE WASH AND SOFT WASH SYSTEMS

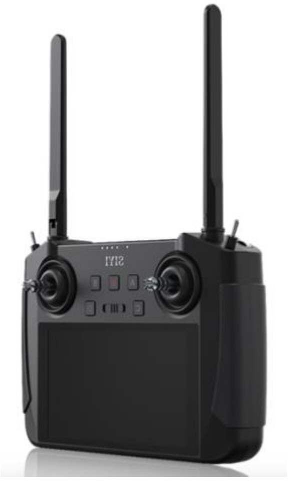
The Apellix Power Wash system is intended for use only by an operator familiar with the safe use of commercial soft wash and power-wash equipment. It is beyond the scope of this manual to describe the cleaning process or the safe operation of the cleaning systems. The Apellix Power Wash system is intended for use by an experienced UAS pilot and an experienced and skilled operator for the pumps, power generator, and other systems.

Under battery power only, the Apellix Power Wash system is intended only for commercial soft wash equipment (i.e., less than 300 psi pumps). With the optional ground power, the Apellix Power Wash system can be used with most commercial pressure washing equipment up to 3,000psi and 8 gpm. The pilot/operator is responsible for securing the correct equipment and process that works with the Apellix drones. Please get in touch with Apellix if you have any questions.

The pilot/operator is responsible for setting up and running the pressure wash and soft wash systems and components safely and in a way that does not negatively affect the operations of Apellix systems.



Apellix Power Wash Drone (untethered)
Figure 1



Radio Controller
Figure 2

Apellix Power Wash Systems Overview

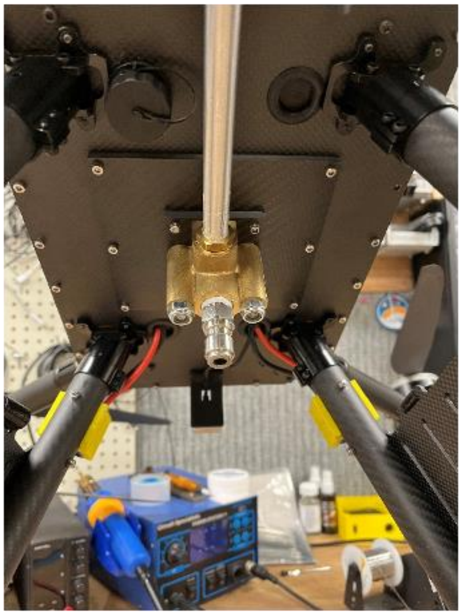
The Apellix Power Wash system consists of the following main components:

- An Apellix heavy-lift power wash drone (Figure 1).
- A radio controller - a handheld radio frequency (R.F.) transmitter (Figure 2).
- An optional 10,000 watt ground-based power supply running in the U.S. on conventional 240 volts A.C. connected to the drone with a high-voltage tether.
- A remote actuated inline ball valve to turn on and off the materials (cleaning agent, rinse, etc.) flowing from the ground to the aircraft. The valve is placed inline, downstream from the pump, with the hose system with a 3/8" quick connect hose.
- Other miscellaneous components and parts which can include spray tips and nozzles, pivot couplers, documentation, travel case(s), etc.

Apellix Power Wash Drone

The Apellix Power Wash drone comprises a frame, arms, motors, propellers, batteries, electronics for flight navigation, etc. In addition, it has a 3/8" Quick Connect at the bottom of the drone (Figure 3) to attach a hose and a 3/8" Quick Connect at the location where a spray tip is inserted into the spray wand (sometimes called a lance). The connectors on the drone fit most standard pressure-washing systems hoses.

The ground-powered version also has an electrical connection for a power tether. The Apellix Power Wash system is controlled using a Radio Controller (Figure 2). The Radio Controller allows the individual piloting the system to control the drone using radio signals.



Underside of Drone
Figure 3

Ground Power System and Tether (optional)

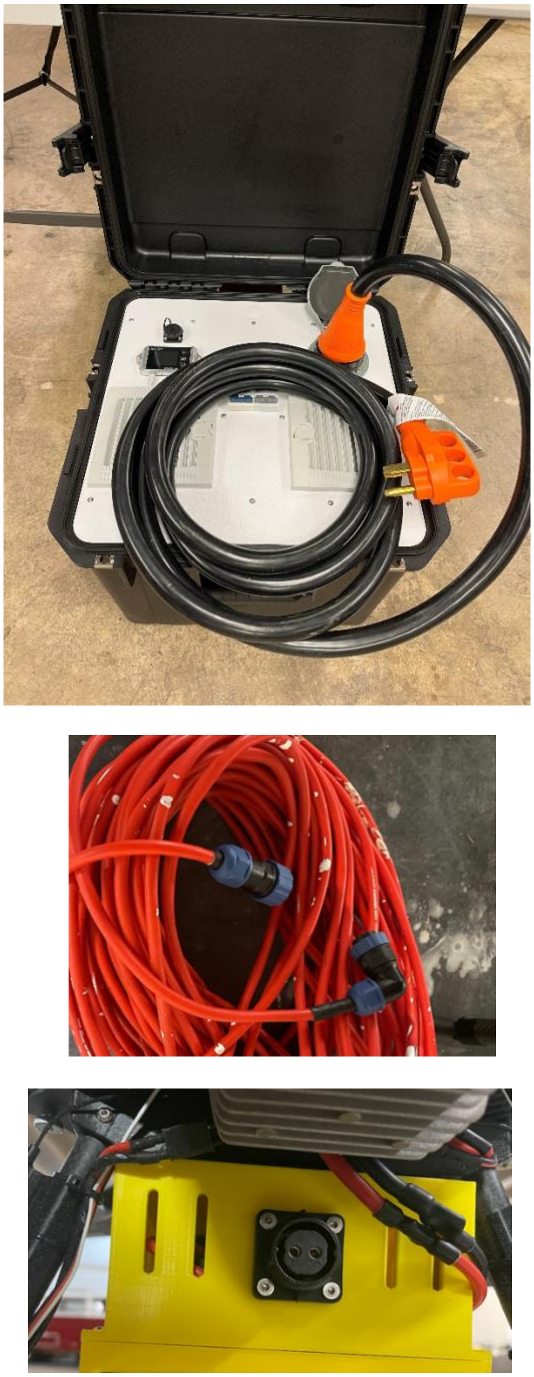
The optional ground-based power supply consists of a ground base station and a 300' tether connected to the drone. The base station (Figure 4) plugs into a generator or 240 Volts AC ground power supply with a 50A plug (NEMA L14-50). This system allows the drone to fly without relying on batteries, although batteries are on the drone as a safety measure in case of power interruption or failure.

The Apellix ground power unit requires at least 40A of 240 Volts AC power from a generator or a ground power source rated for at least a 40A load. If using a generator for power, it must have a minimum 10,000-watt continuous power rating. If you are unsure of ratings, consult a qualified electrician.

High-voltage electrical systems are inherently dangerous. Extreme caution should be exercised when operating. The system must not get wet, be allowed to overheat or be improperly staged. The tether must be inspected before each use to ensure it is in working order with no damage to the insulating sheath that protects the conductors. Further, the user must operate the system safely and correctly.

Plug the Apellix Ground Power unit into your generator or outlet using the thick black 240-volt electrical cable with a NEMA 14-50 plug. The female power receptacle on the base station box is on the top right side of the control plate, looking from the front (with the lid hinge to the rear).

The orange electrical wire cable connecting the base station box to the drone, referred to as the power tether, is much smaller than the black 240-volt electrical cable. The power tether is installed using a locking connector that must be screwed in with a twist ring.



Base Station and Apellix Ground Power

Figure 4

Inline Spray Control System

The Apellix Power Wash system has a battery-powered inline remote actuated valve (Figure 5) that turns the flow of liquids and materials to the drone on and off. It consists of a valve placed inline on the ground, a box containing the electronics and wireless signal receiver, and a battery. The valve is switched on/off (open/closed) from the radio controller.

When the drone is in the air, the pilot can turn on the flow of materials by using the switch/button on the Drone Controller. The pilot uses the same switch/button to turn off the flow of materials through the hose.

Apellix drones that utilize the optional ground-based power supply contain an optional inline hand-turned ball valve and an optional inline pressure gauge.

Remote Activated Valve
Figure 5

Other Components and Parts

The Apellix Power Wash system utilizes universal parts that fit most pressure washers and soft wash systems. Using your system requires pumps, hoses, spray tips, water and/or chemicals, etc. The system has spray nozzles with different orifice sizes and spray patterns. With the purchase or lease of an Apellix Power Wash system, you receive access to Apellix documents and materials, including the Apellix Safety Manual and the Terms of Sale document. You must review and understand these documents' content to ensure the system's safe operations.

SAFETY

Before operating the Apellix system, it is critical that the pilot in charge and related personnel review the Apellix Safety Manual.

It is the operator's responsibility to pilot, maintain, and use this system safely. While the Apellix aerial robotic systems contain an array of safety features engineered to reduce risk and deliver the safest technology possible, it is still possible to crash. This could lead to potential damage to people and property. Before operating the Apellix system, it is critical that the pilot in charge and related personnel review the Apellix Safety Manual.

This manual is specific to the operation of Apellix aerial robotic devices and does not seek to supersede company or work site safety rules and best management practices (BMP). All facility safety practices should be strictly observed and adhered to while operating Apellix robotic devices.

Be mindful that before each flight, you must ensure you have flight authorization and, in the United States, have checked the FAA Notice to Airmen (NOTAM). Additionally, you must secure insurance, know the weather conditions, complete aircraft systems preflight checks, and understand all job site hazards. Remember, safety is no accident.

To ensure safe operations, you must comply with all operational specifications, including but not limited to temperature, wind speed, rain or precipitation, minimum distance to the surface being worked on, tether and hose management, etc. In addition to operations procedures, you are responsible for ensuring the aircraft and related systems are fully functional each time they are used. You must also ensure all equipment maintenance and service intervals are met. Failure to do so voids the warranty.

Operational Parameters

As with any drone or aerial system, you must operate only when weather conditions permit and are within an acceptable range.

- Do not attempt to fly in precipitation (rain, snow, sleet, etc.), fog, sustained winds or wind gusts above 15 mph/24 kph
- The Apellix Power Wash Systems are designed for and should only be used outside in unobstructed airspace.
- Do not fly if there is no GPS lock, a lock on less than nine satellites, or magnetometer interference.
- Do not operate in ambient temperatures less than 45F or more than 110F (7°C to 43°C).
- In warm weather, do not leave the Apellix system in direct sunlight.

While it is expected for the Apellix Power Wash systems to operate in wet environments where there are sprays of liquids, the system is not waterproof. It contains electrical batteries, power supplies, and electronic components, which are dangerous to operate in wet environments. To avoid the risk of shock and damage to the system, keep the drone, electrical systems, and components as dry as possible and avoid placing them in situations where they may become saturated or completely wet. No part, component, or anything electrical should be submerged or partially submerged in liquid.

The Apellix Power Wash systems are designed to operate within FAA Section 107 (U.S.) regulations, with a weight limit of 55 lbs., including the drone, tether, hoses, and fluids in the hose. Depending on the configuration, the hoses used, and the weight of the materials, the Apellix Power Wash systems can fly up to 190 ft (58 m) above ground level. It is the pilot's responsibility to determine the weight to ensure the safe operation of the system and compliance with regulatory requirements.

INITIAL SYSTEM SETUP

The Apellix Power Wash system is typically shipped in three boxes. The largest box contains the drone and the radio controller. The next-largest box (optional) contains the ground power system, including source plugs for the generator or ground power connection and a 300' lightweight tether for high-voltage connection to the aircraft. The third box (the second box if battery-only) contains the 3/8th inch remote-controlled inline valve with quick-connect fittings for connecting the inline valve assembly between the pump and the material tether (pressure hose) and other parts such as the battery charger.

Please inspect and inventory all parts upon receipt. Contact the Apellix Support Center at +1-904-647-4511 (voice or text) or by email at support@apellix.com if anything is missing or damaged or if you have any questions or concerns regarding the equipment.

A summary of the setup process is provided in the Quick Start Guide. A more detailed explanation follows.

Drone Setup

1. Remove the Apellix Power Wash drone and tools from travel cases. Save all packing materials. Inspect for damage.
2. Set the drone on a flat, stable surface, then extend the arms to flight position (horizontal) by sliding red locking pins toward the center of the aircraft, then raise the arm until it clicks (Figure 6).
3. Ensure the folding propellers are securely mounted on motors, ensure they are not touching each other, and open/unfold them. IMPORTANT: Failure to properly install a propeller or if it is loose, damaged, or broken will likely result in a crash upon takeoff. The propellers must be facing the correct direction with the proper orientation.
4. Place the drone on the ground in an open, outdoor area away from people or potential obstructions.
5. Turn on the radio controller. It should beep and confirm a successful self-test.
6. Install two batteries securely on the drone (one on each side, Figure 7) using Velcro straps and connect power to the drone using the yellow connector on the battery connected to the connector on the drone. This connection only fits one way. The system will beep once to indicate power. If not, see the operating manual.

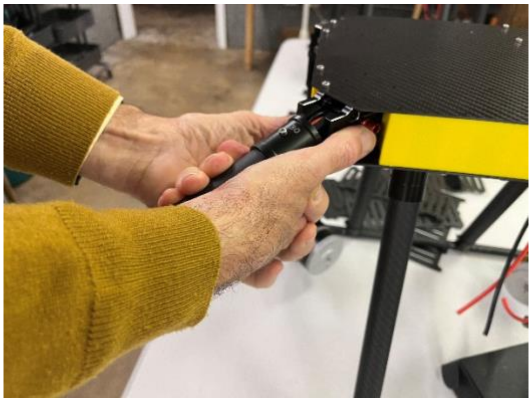


Figure 6

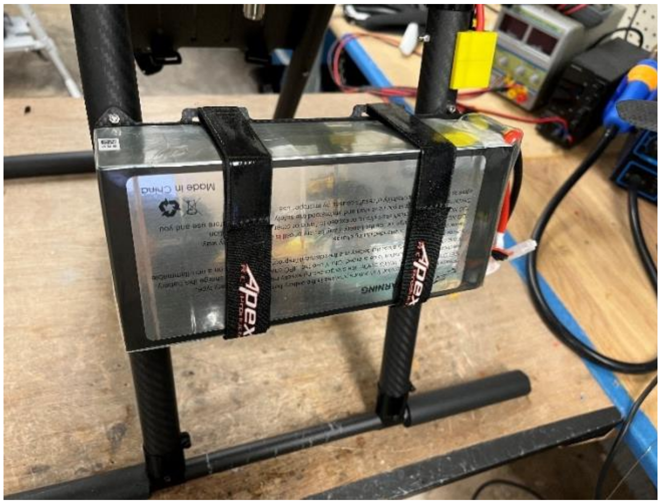


Figure 7

ALWAYS KEEP HANDS AWAY FROM PROPELLERS AT ALL TIMES INCLUDING WHEN CONNECTING OR DISCONNECTING BATTERIES.

7. Perform Calibration and confirm successful Calibration. (Instructions)
    a) Compass/Magnetometer Calibration. Any time the drone has been moved more than 20 miles; a compass/magnetometer calibration is required. To Calibrate:
        (1) With drone batteries installed and connected, perform the Calibration. Do not do this with the ground power connected to the drone.
        (2) Flip the toggle switch on the Radio Controller multiple times until you see the indicator lights on the back of the drone flash.
        (3) The compass calibration process will start. Put the remote controller where you can see its screen.
        (4) Lift the drone and hold it horizontally. The aircraft’s indicators lights should be yellow. Now, spin in a clockwise circle 360 degrees several times until the indicators turn solid green.
        (5) Next, hold the drone vertically and spin around in a counterclockwise circle 360 degrees several times until the indicators on the drone turn solid green.
        (6) Place the drone on the ground and verify the calibration.
        (7) If the drone indicator lights blink red and yellow alternatively after calibration, the calibration has failed. There could be a high level of magnetic or other interference. Change location and try the calibration again.
        (8) Confirmation of successful Calibration will be the indicator lights blinking green
        (9) A magnetometer calibration is recommended every three months if the UAV has not been moved more than 20 miles or if there has been excessive sun or earth magnetic activity.
8. For optional ground power:
    a) Position the optional ground power unit near a power source (generator or land power) in a safe location on level ground where it will be safe from people or hazards.
    b) Connect the power tether to the aircraft using the 300' lightweight high-voltage line (the red cable), ensuring the plug is seated correctly and locked in place with the twist fitting.
    c) Connect the ground-based power unit to a generator or land power receptacle using the NEMA 14-50 plug (the thick black cable). Do not turn on the power at the ground-based power supply.
    d) Turn on the power at the ground power unit (the final step is just before takeoff).
9. The drone is now ready for flight.

FLIGHT OPERATIONS

Before any flight, ensure a thorough safety review has been conducted along with a flight plan. In addition, inspect all equipment to ensure everything is in working order. While flight setup is covered in the Quick Start Guide, a more detailed explanation follows.

Takeoff and Use

1. Complete the drone startup checklist and **review your flight plan and job safety analysis**.
2. Prepare the drone by installing batteries and ensuring Calibration, BUT DO NOT CONNECT OPTIONAL GROUND POWER AT THIS TIME (see Initial System Setup)
3. Position the pump and reservoir in an easily accessible location that does not interfere with the pilot or tethers (hoses and electrical power cable).
4. Install inline valve to output connection on the pump using a 3/8ths inch hose.
5. Use the quick connection to attach the material tether/spray hose (lightweight 300 psi-rated soft-wash hose or a heavier 3,000 psi-rated hose) to the inline valve.

6. Uncoil and lay flat the entire length of the material tether hose to avoid kinks.
7. Connect the other end of the material tether to the drone's underside using the quick connection.
8. Install and connect batteries on the drone (2-22,000 mAh) and remote pump valve (3300 mAh).
9. For Optional Ground Power: Connect the power tether to the aircraft using a locking twist connector. DO NOT TURN ON GROUND POWER AT THIS TIME.
10. Start pump. Set to lowest pressure and flow setting.
11. Test the pump valve under low pressure and flow rate using the button on the radio controller to start the flow of material from the pump to the drone, then stop the flow from the UAS.
12. Adjust pump pressure and flow rate to desired performance.
13. For Optional Ground Power: Turn on ground power using the main switch on the ground power unit.
14. Initialize the drone by moving both joysticks on the radio controller to the startup sequence (both sticks are moved down and to the center). The drone will emit a beep to indicate a connection between the radio controller and the drone.
15. When the flight zone is clear, start the motors by engaging the startup sequence. Frequently this is both sticks moved in the middle and down. If you are unfamiliar with the radio controller operation, please refer to the controllers operating manual. Take off with a brief (1-2 second) upward throttle movement, hover clear of any obstacles and remove your hands from the sticks while closely observing the drone to ensure it operates stably.
16. Stage the material tether for use by executing liftoff, flying the UAS vertically to fully extend the material tether from the pump fully, then position the drone at the desired initial working height.
17. Perform the desired cleaning by opening and closing the inline valve using the switch/button on the radio controller.
18. Be vigilant to battery power levels as indicated on the radio controller. Do not attempt to drain batteries fully. If battery levels reach a critical level, the UAS will attempt an emergency landing, resulting in limited pilot control of the UAS and potential landing hazards. **The UAV does not return home upon a low battery. It lands straight down.**
19. Always turn off the radio controller before the battery change to avoid the risk of accidental propellor action when connecting or reconnecting battery power.

Landing

1. Whenever the radio controller indicates low power (low voltage) or whenever there is a red flashing light on the drone indicating a common battery condition, land immediately, this may occur even when using the optional ground power unit.
2. Avoid the tether interfering with landing, drape the material tether (and power tether) horizontally along the ground, particularly in the last few feet before touchdown.
3. Once on the ground, turn off the motors using the radio controller. This is often done by keeping the left stick in the full down position.
4. Immediately turn off optional ground power using the central power unit's main switch.
5. Disconnect the batteries on the drone. **Always keep hands away from the propellers when possible, especially when connecting or disconnecting the batteries.**
6. If landing only to replace batteries:
    a) Remove batteries and replace them with fully charged batteries. Reconnect.
    b) Switch on optional ground power at the ground power unit.
    c) Initialize the drone by moving both joysticks on the radio controller. The drone will emit three beeps to indicate a connection between the radio controller and the drone.

    d) When the flight zone is clear, start the motors with a brief (1-2 second) whole upward throttle movement.
    e) Commence liftoff.
7. If landing to conclude flights:
    a) Remove batteries.
    b) Disconnect the optional ground power tether.
    c) Disconnect material tether at a quick connection.
    d) Thoroughly clean and inspect UAS. See Maintenance.

Maintenance

1. Remove batteries and disconnect all power and material tethers.
2. Flush all hoses with water, soap, or cleaners to remove any chemicals. Wipe the outside of the hoses with a damp rag and coil the hoses for transport and storage. Make sure everything is clean and dry. It is important not to kink the hoses or coil them too tight.
3. Once motors are cool to the touch, wipe down the exterior with a damp cloth. Make sure everything is clean and dry. Do not pour or spray water over the motors, or any areas of the drone containing battery connections or electronics. Fold the arms down for transportation and storage.
4. If you are using the optional ground-based power supply, make sure all electrical cables are removed from the ground base station, are wiped clean, dried, and coiled for transport and storage. Wipe the inside instrument panel with a dry cloth. Then with a damp rag wipe the exterior of the box and make sure everything is clean, dry, and ready for transport and storage.
5. Battery maintenance: only use the charger shipped with the aircraft. Charge batteries in an open area, away from flammable materials, liquids, and surfaces. Never charge batteries below freezing temperatures, and never charge batteries that are hot to the touch. Never store loose batteries together, and if the battery is stored for over three months, the environmental conditions should be 23±5℃ with 65±20% relative humidity. For more details, visit https://genstattu.com/bw/
6. All equipment including pumps, generators, materials reservoirs, spray tips, etc. should be cleaned and maintained as per the manufacturer's instructions and best management practices. The cleaning and maintenance procedures for these items are outside the scope of this document.

ADDITIONAL RESOURCES

Inline on/off valve

The Apellix Power Wash system has a battery-powered inline remote actuated valve that turns the flow of liquids and materials to the drone on and off. It consists of a valve placed inline, a box containing the electronics and wireless signal receiver, and a battery. The valve is placed in line the electronics box is connected to the valve, and a battery is plugged into the box. The system is then operated from the Drone Remote Controller with a toggle switch.

Keeping the electronics box and external battery dry when setting up the inline valve is essential. Select an area for the inline valve that is out of the way of spray, puddles, and liquids and where it will not be accidentally tripped over, dragged, or pulled into a wet area after locating a dry site that will remain dry, set up the inline value using the quick-connect connectors on the bottom of the blue inline valve. The hose coming from the compressor should go into the inflow quick-connect receptacle. Next, plug the battery into the yellow electronics box that connects to the inline on/off valve.

When the drone is in the air and close to the structure or object to be rinsed or cleaned, the pilot can turn the flow of materials on or off by flipping the toggle switch on the Drone Controller. To turn off the flow, the drone pilot flips the toggle switch on the Drone Controller to the off position.

Start with a minimum flow. Once you are comfortable with the drone's performance, slowly increase the flow by having a helper adjust settings on the pump or wash equipment. Exercise extreme caution as higher flows, be it volume or pressure, impact the drone's flight more. At no time should you use a flow and pressure rate (via either the pump or the spray tip orifice size) that degrades the drone's ability to operate safely.

The wireless functionality whereby the Drone Controller sends a signal to the battery-powered inline valve may be negatively impacted by the distance or location of the pilot and the inline valve. The presence of a wall, vehicle, structure, a long distance, etc., between the two will impede the signal and may degrade it to an extent where it is not strong enough to activate the valve to turn it on or off. For this, and other safety-related reasons, there should always be two people involved in the operations of the systems.

Battery Care

Batteries play a significant role in the operations of the systems thus knowing how to take care of them is important. Poorly maintained and used batteries may cause accidents and malfunctions. If you do not properly maintain batteries, they can also overheat and cause fires. Battery care and maintenance is outside the scope of this document. Please exercise extreme care in their use, operations, cleaning, maintenance, and storage.

BREAKDOWN / CLEANUP

Post-flight cleanup and checks must be completed to maintain the drone and systems in good operating condition, as required by the Apellix warranty and service plans. Begin by wiping down all the drone services with a clean wet cloth. Pay special attention to any location where liquid or droplets may pool or collect. If you have been spraying chemicals, especially caustic or acidic, use a neutralizer to deactivate as much of the chemical as possible and wipe the drone down with a clean cloth moistened with the neutralizer. Then wipe down all the services again, this time with a clean wet cloth dampened with water. Remove, clean, inspect, and store the spray tips.

While cleaning the drone, inspect it for any signs of damage. Best Management Practices include taking the temperature of the motors and, once they are cool, spinning them by hand to see if they bind or click when the motor bell is rotated. Ensure all the post-flight checks listed in the Apellix Safety Document are completed. After cleaning and inspecting the drone, move it to your staging area or, if it is dry and serviced, repack it in its transport case.

The cables leading to the ground-based power supply should be disconnected, cleaned, inspected, and stored. The ground-based power supply box should be wiped with a clean, dry cloth. Once it is clean and dry, check the control plate for any signs of damage or heavy use and clean the air fan vents on the control plate. If there are any signs of smoke, burns or soot marks, electrical shorts, or anything troubling or disturbing, do not use the system again until you have contacted Apellix. Similarly, the wire tether to the drone and the electrical cable connecting to the generator or ground outlet should be cleaned, inspected, and stored using the manufacturers or industry BMPs. For example, BMPs from one of the electrical cable suppliers for the tether from the ground-based power supply box to the drone emphasize the necessity of visually inspecting every inch of the cable for cuts, nicks, cracks, or other damage to the outer case. This is important as the electrical tether may have been dragged across the ground during use. A cut or a nick in the wire casing could let water or moisture in, leading to a failure.

Similarly, a cut or nick might be deep enough to penetrate the wire casing and insulated wires so that when it is bent, the internal wires touch, leading to a failure. A failure of the electrical cable could cause a spark or fire. Further, a loss of the electrical cable could cause a surge in the drone damaging or destroying it. Also, a failure of the electrical cord to the drone may prevent access to the full power it needs, causing it to crash.

The batteries from the drone and the ground on/off inline valve should be cleaned, inspected, and stored using best management practices from the battery manufacturer. Batteries are consumables and have a limited number of charge/discharge cycles. Using old, damaged, or depleted batteries is unsafe and voids the Apellix warranty.

Disconnect the yellow ground-based inline on/off valve electronics box from the battery. The hoses should be disconnected, cleaned, inspected, and stored. The electric on/off valve, the electronics control box, the manual shutoff valve, and the pressure gauge should all be wiped clean, inspected, and stored. If you have been spraying chemicals, especially caustic or acidic, use a neutralizer to deactivate as much of the chemical as possible and wipe down all the surfaces with a clean cloth moistened with the neutralizer. Next, wipe down all the surfaces a 2nd time with a clean wet cloth dampened with water. And finally, wipe down all the services again, this time with a clean, dry cloth. Once everything is clean and dry, inspect it and store it accordingly.

Once the drone, ground-based power supply, and the inline on-off valve components have been cleaned, inspected, and stored, all the cleaning equipment, such as the pump, materials reservoirs, generator, etc., should be cleaned, inspected, and made ready for transport.

RECORDS, COMMUNICATIONS, REPORTING

Records of drone operations, flights, service intervals, and repairs should be kept per the BMPs detailed in the **Apellix Drone Safety Manual**.

Any malfunction should be reported promptly to Apellix. If there is uncertainty with any component of the system, contact an Apellix team member. In the United States, any crash causing damage or injury must be reported to the FAA (limitations apply). Keep a flight and maintenance log and record repairs throughout the usage of the aircraft. Maintain open communication with Apellix to ensure the aircraft can operate as intended.

IMPORTANT NOTES

NOTE 1 – INITIAL PROJECT QUESTIONNAIRE

There are multiple sources for Job Safety Analysis (JSA) sheets, initial project questionnaire, and other pre-flight planning documents. There is a draft of a JSA form in the **Apellix Drone Safety Manual**.

NOTE 2 – SETUP PROCEDURE

Records of drone operations, flights, service intervals, and repairs should be kept per the BMPs detailed in the **Apellix Drone Safety Manual**. This needs to include details on the Compass Calibration procedure.

NOTE 3 – PREFLIGHT CHECKLIST

There are multiple sources of preflight checklists, initial project questionnaire, and other pre-flight planning documents. There is a draft of a JSA and other forms in the **Apellix Drone Safety Manual**.

NOTE 4 – AIRCRAFT MAINTENANCE RECORDS

Records of drone operations, flights, service intervals, and repairs should be kept per the BMPs detailed in the **Apellix Drone Safety Manual.**

NOTE 5 – FLIGHT PLANNING OVERVIEW

Flight planning is a critical component of successful drone flights. You must adhere to BMPs detailed in the **Apellix Drone Safety Manual** including figuring out where and how you will fly, tether management and control, and more.

NOTE 6 – RECOMMENDED SERVICE INTERVALS

The drone must be returned to Apellix for the required annual service interval each year on or before the anniversary date of its delivery or after 2,000 flight hours whichever comes first.

NOTE 7 – GEO FENCING FOR AUSTRALIA

Apellix systems exported from the US to Australia are geo-fenced. They have a maximum range of 500ft/150m from the takeoff location.